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Technical Response Considerations:

Note, the following comments are derived from my understanding of environmental pros and cons of the technologies (tools) discussed. I'm handicapped by not knowing the area or visually seeing the scenario beyond the description provided by the NOAA SSC, Brad Benggio; therefore, use the information provided in context of your first-hand understanding of the situation. My objective is to provide points to consider while formulating response options. Points are made for the following options: dispersants, *in-situ* burning, bioremediation, shoreline cleaners, and shoreline pretreatment. If you have any questions, please contact the NOAA SSC directly.

Dispersant Application

Dispersants enhance the movement of oil into water by reducing the surface tension between the oil slick and sea water. As a result, tiny droplets are formed at the surface and transported into the water column. Often, dispersants are viewed as a trade-off: to reduce potential shoreline impacts, an increased risk to the offshore environment is considered acceptable. The same argument can be made for near-shore use of dispersants, but the risk may be greater than that expected offshore.

Dispersibility. Without a sample of the specific oil for laboratory testing, dispersibility can only be predicted based on past experience. Fresh and slightly weathered IFO180 fuel oils are generally on the threshold between dispersible and nondispersible using Corexit 9527. Exxon's newer formulation, Corexit 9500 is more effective than the Corexit 9527 for many residual fuel oils; therefore, dispersibility would be enhanced using Corexit 9500. IFO180 weathered for more than 24 hours is probably not dispersible by either chemical formulation.

Near-shore concerns for dispersant use include toxicity and tainting of near-shore fisheries. Shellfish impacted by a successful dispersant application near-shore in El Salvador required more than 28 days to expel 98% of accumulated oil and reach "near background" levels.

On Water In-Situ Burning

On water *in-situ* burning has two potential advantages in the current scenario. First, *in-situ* burning reduces the need for additional storage of recovered oil/water and associated disposal cost. Second, it is highly effective if employed early or immediately after a release. The current situation allows time for the preplacement of resources needed for a successful *in-situ* burn operation. During most oil spills the window of opportunity for a burn option is past before the first responders arrive. Oil spreading and weathering (particularity water-in-oil emulsifications) quickly reduce the potential application of in-situ burning. IFO180 may form a burn residue which may be nonfloating. The volume of burn residue would be less than 2% (an estimate) during a successful operation. Burn residues generated in laboratory test and during actual, at sea *in-situ* burn experiments are essentially nontoxic, but smothering effects are possible.

Shoreline Cleaners

Hard surfaces and mangroves. Shoreline cleaners such as Corexit 9580 can enhance the cleanup of hard surfaces and fringing mangroves. The enhanced cleanup on hard surfaces is generally cosmetic improvement and a reduction in time. But for mangroves, application of surface cleaner may significantly reduce mortality.

Beaches. Very little enhancement would be observed using Corexit 9580 on coarse sandy beaches.

Bioremedition at Isolated Beaches

Bioremediation could be considered as a polish or final treatment at isolated or pocket beaches which are either lightly oiled or after gross oil removal. It is my understanding that these pocket beaches are composed of relatively coarse material. Penetration could be as high as 6 inches. The most effective application would be the addition of nutrients via a sprinkler system installed along the upper beach. Ambient sea water can be pumped from the lagoon into a sprinkler system with a metered flow of additional nutrients. Some pretesting would be required to insure that the additional nutrients will not create eutrophic conditions.

Bioremediation may reduce the recovery time by as much as 50% relative to the "do nothing" option. Example, the estimated recovery time is 8-12 months to reach background contamination levels. The addition of nutrients on a regular bases may result in recover within 6 months (is the cost justifiable?).

Shoreline Pretreatment

In addition to preplacement of boom in strategic locations, consider using the high tide wrack as an adsorbent in isolated locations to reduce (not prevent) oiling. The application of chemical pretreatment is possible, but should be evaluated on a case-by-case bases. Consider both the chemical agent and intertidal biology if chemical pretreatment is proposed.